Forest Health Protection
Pacific Southwest Region

Date: August 30, 2012
File Code: 3400

To: Bill Wilkinson, Consulting Forester, Round Valley Tribal Council

Subject: Trip report following site visit to Murphy Ridge Fuel Break area to determine suitability for WBBI project funding (FHP Report N12-05)

At the requests of Bill Wilkinson, Consulting Forester (BBW & Associates, Arcata), a site visit was made to the Round Valley Indian Reservation (RVIR) in Covelo on August 7, 2012. The purpose of the visit was to conduct a field evaluation of current ponderosa pine mortality along the Murphy Ridge Fuel Break. The objectives were to assess the current stand conditions, evaluate for potential treatment through the Forest Health Protection (FHP) Western Bark Beetle Initiative (WBBI) funding.

Background

The Murphy Ridge Fuel Break project consists of 18 acres of established fuel break as well as 24 acres of natural stands east of the fuel break. These are all natural stands that regenerated after initial logging in the 1960-70s. The fuel break and associated stands are all on RVIR Trust Land between Williams Valley and Bluenose Ridge approximately 3½ miles northeast of Covelo (T23N R11W Sections 10, 13 and 14). These stands are at an elevation of 2475 ft. with 2011-2012 precipitation of 25.83 inches, well below the average 42.23 inches for the area. The 18 acre shaded fuel break proved instrumental in containing the 2008 MEU Lightning Fire. The additional 24 acres are comprised of dense second growth small sawtimber.

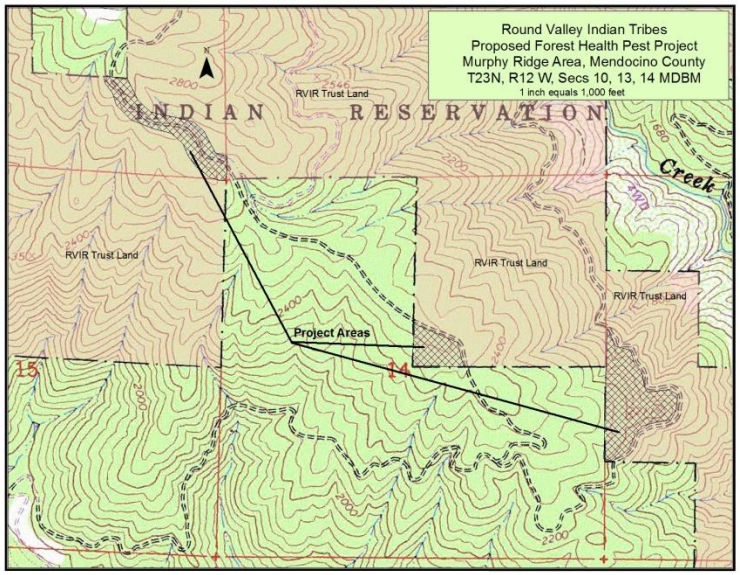

Figure 1. Map of project area with specific treatment acres cross-hatched.

Conifer timberlands on the RVIR are managed primarily for timber production in accordance with the 2006 RVIR Forest Management Plan. Tribal silviculture specifies single tree or group selection management as the preferred practice. The goal is to grow high

NORTHERN CALIFORNIA SHARED SERVICE AREA
3644 AVTECH PARKWAY, REDDING, CA 96002
(530) 226-2437

Cynthia Snyder
clsnyder@fs.fed.us

Pete Angwin
pangwin@fs.fed.us

value sawtimber that can be periodically harvested for tribal income. This practice is intended to eventually produce stands that mimic pre-contact forest conditions. Compatible uses identified in the management plan include fuels management, tribal member recreation, wildlife management, harvest non-timber forest products, and subsistence gathering. The 18-acre Murphy fuel break lies within the timber landbase and is managed both for timber production and as a fuels management area designed to stop or slow the advance of a wildfire under typical fire conditions. The additional 24 acres proposed for treatment is also in the timber landbase and is to be managed for timber production over the long term. It has been identified as a potential area for a timber stand improvement thinning-from-below treatment, designed to improve vigor and growth of the residual trees. As this area is also on Murphy Ridge it will also serve the dual purpose of fuel reduction and essentially represent a shaded fuel break, after treatment.

Observations

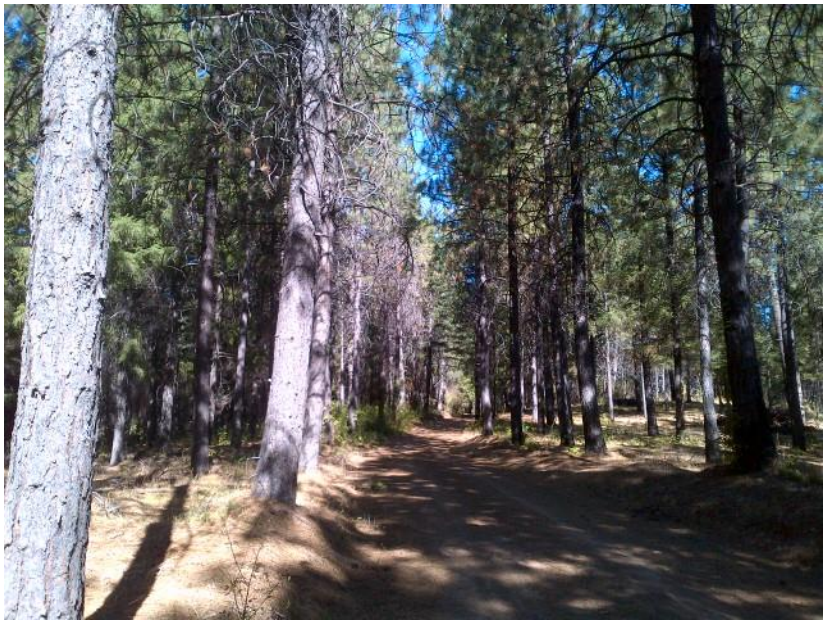

Figure 3. Dense stand conditions along the Murphy Ridge Fuel Break.

The Murphy Ridge area is a mix of ponderosa pine (*Pinus ponderosae*) and Douglas-fir (*Pseudotsuga menziesii*) with some scattered Pacific madrone (*Arbutus menziesii*) and a heavy understory of poison oak and Douglas-fir seedlings. In the fuel break area the basal area in 2004 (from the 2004 Continuous Forest Inventory measurement) was 172 sqft/ac. The current basal area is estimated to be about 140 sqft/ac. The reduction is due to tree mortality and dead tree removals. In the additional 24 acres the average basal area was 119 sqft/ac in 2004 and has increased to nearly 140 sqft/ac by 2012. Average diameter in the project area is about 9 inches DBH with 264 trees per acre in the fuel break and 312 in the additional acres.

Figure 2. Western pine beetle-caused mortality in ponderosa pine at edge of 2008 MEU Lightning Fire.

The MEU Lightning Fire of 2008 burned right up to the edge of the fuel break and into some of the additional acres. Mortality due to scorch was treated post-fire. However, additional mortality due to western pine beetle (*Dendroctonus brevicomis*) has been ongoing since 2011 within the fuel break and additional acres. Density combined with dry conditions has led to high stress in the ponderosa pine. The fifth year following the fire has shown continued mortality by western pine beetle.

Management options would include no action and thinning from below. If no action were taken the mortality would most likely continue as long as host is abundant and conditions remain droughty. Thinning is the most acceptable management for western pine beetle in dense ponderosa pine stands. For best results thinning should reduce overall density to approximately 80-100 sqft/ac and retaining a mix of ponderosa pine and Douglas-fir and hardwoods.

Discussion

Thinning projects in this area, including the fuel break and adjacent stands, would meet the minimum requirements for western bark beetle funding and are supported by the FHP staff through this. If you are interested in this competitive funding please contact Cynthia Snyder at 530-226-2437 for assistance in developing and submitting a proposal.

If you have any questions regarding this report and/or need additional information, please contact Cynthia Snyder at 530-226-2437 or Pete Angwin at 530-226-2436.

/s/ Cynthia Snyder

Cynthia Snyder, Entomologist
Northern California Shared Service Area

cc: Bill Wilkinson, Stephanie Boggs, Gerald Jones, Kathy Roche, Pete Angwin, Sheri Smith, and Phil Cannon

Insect and Disease Information

Western Pine Beetle (*Dendroctonus brevicomis*)

Hosts: Ponderosa pine and Coulter pine

Distribution in California: Throughout the range of suitable host trees.

Identification: Smallest of the western Dendroctonus species, this black cylindrical beetle is about the size of a grain of rice (4 mm long). Egg galleries are winding and packed with frass. Larval galleries lead away from the main gallery for short distances before turning into the outerbark. Small, reddish pitch tubes (sometimes fairly obscure) are signs of successful attack. Attacked trees often exhibit woodpecker feeding with only portions of the outer bark removed. Sapwood of infested trees usually shows evidence of the characteristic bluestain associated with fungi introduced by attacking beetles.

Effects: Successful attacks result in death of the host tree. Groups of trees are sometimes killed, especially when growing under crowded conditions. Since larger trees are generally preferred, the western pine beetle can dramatically alter the character of a forest that comes under attack.

Ecological Role: The western pine beetle serves as a key mortality agent for ponderosa pines weakened by the effects of old age, drought, smog, diseases, or competition with other trees.

Stand structure can be altered and gaps can be created in the stand as the bark beetles kill larger trees, either singly or in groups. In those instances where ponderosa pine occurs in mixed stands with firs, the western pine beetle can accelerate the successional process by selectively removing the early seral species from the stand. Trees infested by the western pine beetle provide temporary food sources for woodpeckers and other insectivores. Infestation by western pine beetle sets the stage for other agents, such as wood borers and decay fungi that are involved in the recycling of nutrients back into the soil.

Life History: In the northern part of its range and at higher elevations, the western pine beetle completes two generations in one year, with adult beetles flying in early to mid-June and mid to late August. In the southern part of its range and at lower elevations, the beetles produce three and sometimes four generations per year. Attacks may be as early as March and as late as November. Female beetles locate a suitable host and initiate attacks by burrowing through the bark. They release a pheromone that attracts other beetles and leads to mass attacks of the host tree and sometimes several trees in a group. Each female lays about 60 eggs in individual niches cut in the sides of the egg gallery. These eggs hatch in two weeks and young larvae feed initially in the phloem, later moving into the outer bark where most of their development takes place. After four larval stages, the insects turn into pupae and then adults.
Conducive Habitats: The western pine beetle breeds most commonly in trees of reduced vigor. While older, larger trees are generally preferred, younger trees can also be infested, especially when they occur in dense stands, are infected by pathogens, or are damaged by

fire. During periods of drought, the western pine beetle will be particularly prominent and can overcome apparently healthy trees.

Similar Insects: Other bark beetles attacking ponderosa pine may be distinguished from western pine beetle by their egg gallery characteristics and adult appearance. Egg galleries of the mountain pine beetle are straight and vertical, and those of the engraver beetles possess a nuptial chamber with one to several tunnels radiating out from it. Engraver beetle egg galleries are free of frass. Ips adults display a pronounced concavity at the rear end of the elytra that possesses three to six spines on either side. The elytral declivity on Dendroctonus adults is rounded and does not possess any spines.
Management Strategies: The detrimental effects of western pine beetle can best be minimized by providing vigorous growing conditions for host trees. Stand densities below the "Upper Management Zone" (Cochran 1992; Cochran et al 1994) will provide sufficient growing space for trees and will minimize potential habitat for the western pine beetle. Dendroctonus beetle group-kills cause a limiting Stand Density Index of 365 that differs little between stands on good and poor sites in California (Oliver 1995). In the past, "high-risk" trees (those most likely to be infested by the western pine beetle) were identified by various hazard rating systems (Keen 1936; Salman and Bongberg 1942; Smith et al. 1981) and removed. Short-term treatments are also available to protect individual, high value trees such as spraying insecticides on tree boles to prevent bark beetle attacks. Other short-term treatment options for individual trees are currently being evaluated such as the use of anti-aggregation pheromones and non-host angiosperm volatiles. Tree injection systems are being explored to treat trees with systemic insecticides.